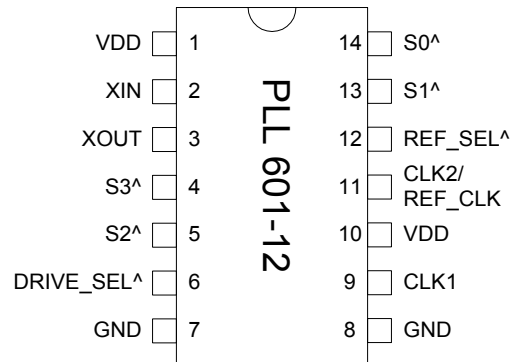


**Dual Output PLL Clock with Selectable Odd Multiplier**

**FEATURES**

- Selectable multipliers (x2.5, x2.75, x3, x4.25, x5, x5.5, x5.75, x6, x6.25, x10, x11, x11.5, x12, x12.5).
- Crystal input range, 13MHz to 31MHz (see Selection Table for detailed acceptable input ranges).
- Maximum output frequency: 312.5MHz
- 2 CMOS outputs.
- Selectable output drive (Standard or High-Drive).
- Selectable REF\_CLK output.
- 3.3V operation.
- Available in 14-Pin SOIC.

**PIN CONFIGURATION  
(Top View)**

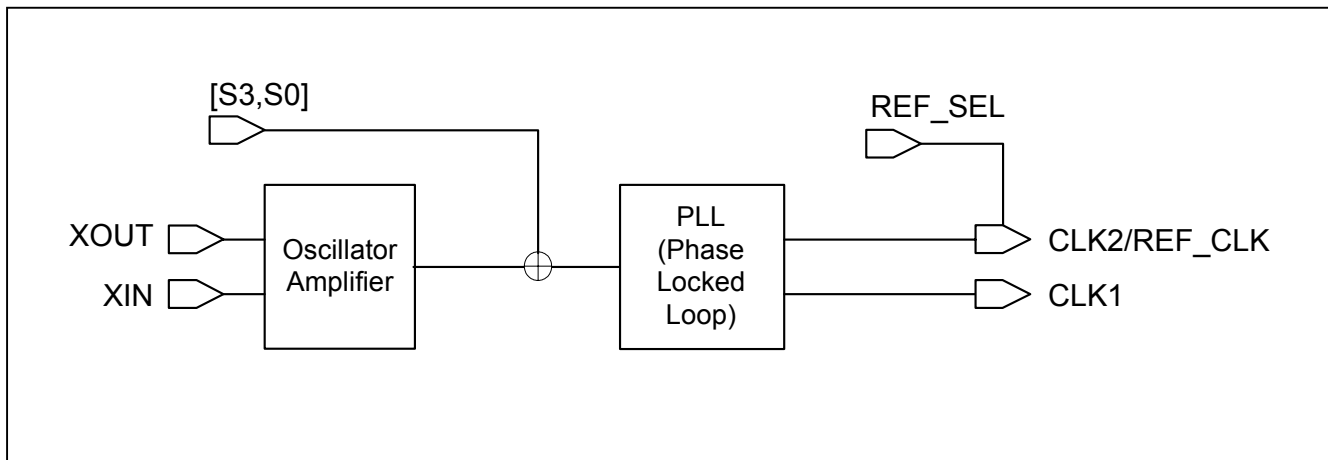


<sup>^</sup>: Internal pull-up.

**DESCRIPTION**

The PLL601-12 is a highly flexible XO with selectable multipliers and two CMOS outputs (one of which can be selected to be REF\_CLK). Thanks to PhaseLink's advanced Phase Locked Loop technology, it allows a wide choice of selectable multipliers that permits the user to achieve useful frequencies from standard low cost crystals. It accepts fundamental parallel resonant mode crystals from 13 to 31MHz, and is ideal to generate 156.25MHz from a standard 25MHz crystal.

**BLOCK DIAGRAM**



## Dual Output PLL Clock with Selectable Odd Multiplier

### FREQUENCY SELECTION TABLE

S3	S2	S1	S0	Xtal Min	Xtal Max	Multiplier
0	0	0	0			Reserved
0	0	0	1			Reserved
0	0	1	0	19	36	X 4.25
0	0	1	1	15	28	X 11
0	1	0	0	14	26	X 12
0	1	0	1	13	25	X 12.5
0	1	1	0	14	27	X 5.75
0	1	1	1	14	26	X 3
1	0	0	0	14	27	X 11.5
1	0	0	1	15	28	X 5.5
1	0	1	0	15	28	X 2.75
1	0	1	1	16	31	X 5
1	1	0	0	16	31	X 2.5
1	1	0	1	16	31	X 10
1	1	1	0	14	26	X 6
1	1	1	1	13	25	X 6.25

**Note:** Internal pull-ups default S3, S2, S1, and S0 to '1' when not connected

### PIN DESCRIPTIONS

Name	Pin #	Type	Description
VDD	1,11	P	Power Supply.
XIN	2	I	Crystal input.
XOUT	3	I	Crystal output.
S3	4	I	Multiplier selector pins. These pins have an internal pull-up that will default SEL to '1' when not connected to GND.
S2	5	I	
DRIVE_SEL	6	I	Selector pin. If DRIVE_SEL is '0', outputs are at high drive. If '1' or not connected, outputs are standard drive (internal pull-up).
GND	7,8	P	Ground.
CLK1	9	O	CLK1 output is the output of the reference frequency (crystal) after multiplication through the Phase Locked Loop.
CLK2/REF_CLK	10	O	CLK2 or REF_CLK output (depending on REF_SEL). CLK2 is in phase and at the same frequency as CLK1. REF_CLK provides the same output as the crystal reference.
REF_SEL	12	I	Selector pin. This pin if set to '0' selects REF_CLK on pin 10. If not connected, it defaults to '1' (pin 10 = CLK2). Internal pull-up.
S1	13	I	Multiplier selector pins. These pins have an internal pull-up that will default SEL to '1' when not connected to GND.
S0	14	I	

## Dual Output PLL Clock with Selectable Odd Multiplier

### ELECTRICAL SPECIFICATIONS

#### 1. Absolute Maximum Ratings

PARAMETERS	SYMBOL	MIN.	MAX.	UNITS
Supply Voltage	$V_{DD}$		4.6	V
Input Voltage, dc	$V_I$	-0.5	$V_{DD}+0.5$	V
Output Voltage, dc	$V_O$	-0.5	$V_{DD}+0.5$	V
Storage Temperature	$T_S$	-65	150	°C
Ambient Operating Temperature*	$T_A$	-40	85	°C
Junction Temperature	$T_J$		125	°C
Lead Temperature (soldering, 10s)			260	°C
ESD Protection, Human Body Model			2	kV

Exposure of the device under conditions beyond the limits specified by Maximum Ratings for extended periods may cause permanent damage to the device and affect product reliability. These conditions represent a stress rating only, and functional operations of the device at these or any other conditions above the operational limits noted in this specification is not implied.

\* **Note:** Operating Temperature is guaranteed by design for all parts (COMMERCIAL and INDUSTRIAL), but tested for COMMERCIAL grade only.

#### 2. Crystal Specifications

PARAMETERS	SYMBOL	CONDITIONS	MIN.	TYP.	MAX.	UNITS
Crystal Resonator Frequency	$F_{XIN}$	Parallel Fundamental Mode (see Selection Table)	13		31	MHz
Crystal Loading Rating	$C_L$ (xtal)	At $V_{CON} = 1.65V$		16		pF
Recommended ESR	$R_E$	AT cut			30	$\Omega$

#### 3. General Electrical Specifications

PARAMETERS	SYMBOL	CONDITIONS	MIN.	TYP.	MAX.	UNITS
Supply Current, Dynamic (with Loaded Outputs)	$I_{DD}$	15 pF load			15	mA
		$F_{out} < 30MHz$			30	
		$30MHz < F_{out} < 100MHz$			40	
Operating Voltage	$V_{DD}$		2.97		3.63	V
Short Circuit Current				$\pm 50$		mA

#### 4. AC Electrical Specifications

PARAMETERS	SYMBOL	CONDITIONS	MIN.	TYP.	MAX.	UNITS
Output Clock Rise Time		0.8V ~ 2.0V with 10 pF load			1.5	ns
		0.3V ~ 3.0V with 15 pF load		3.7	5	
Output Clock Fall Time		2.0V ~ 0.8V with 10 pF load			1.5	
		3.0V ~ 0.3V with 15pF load		3.7	5	
Output Clock Duty Cycle		Measured @ 1.4V	45	50	55	%

## Dual Output PLL Clock with Selectable Odd Multiplier

### 5. Jitter Specifications

PARAMETERS	CONDITIONS	MIN.	TYP.	MAX.	UNITS
Max. Absolute Jitter, peak-to-peak	Short term		60	100	ps
Max. Jitter, cycle to cycle				60	ps
Phase Noise, relative to carrier, 125Mhz(x5)	100 Hz offset		105		dBc/Hz
Phase Noise, relative to carrier, 125Mhz(x5)	1kHz offset		125		dBc/Hz
Phase Noise, relative to carrier, 125Mhz(x5)	10kHz offset		130		dBc/Hz
Phase Noise, relative to carrier, 125Mhz(x5)	100kHz offset		125		dBc/Hz

**Dual Output PLL Clock with Selectable Odd Multiplier**

**PACKAGE INFORMATION**

14 PIN Narrow SOIC ( mm )

Symbol	SOIC	
	Min.	Max.
A	1.35	1.75
A1	0.10	0.25
B	0.33	0.51
C	0.19	0.25
D	8.58	8.69
E	3.85	3.97
H	5.80	6.20
L	0.40	1.27
e	1.27 BSC	

**ORDERING INFORMATION**

**For part ordering, please contact our Sales Department:**

47745 Fremont Blvd., Fremont, CA 94538, USA

Tel: (510) 492-0990 Fax: (510) 492-0991

**PART NUMBER**

The order number for this device is a combination of the following:  
Device number, Package type and Operating temperature range

**PLL601-12 S C**

PART NUMBER

TEMPERATURE  
C=COMMERCIAL  
I=INDUSTRIAL

PACKAGE TYPE  
S=SOIC

<b>Order Number</b>	<b>Marking</b>	<b>Package Option</b>
PLL601-12SC	P601-12SC	16-Pin SOIC (Tube)
PLL601-12SC-R	P601-12SC	16-Pin SOIC (Tape & Reel)

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